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Seventy-seven presents were announced as having been received since the last meeting, including amongst others :—

A. Fowler, Popular Telescopic Astronomy, presented by the publishers ; photographic enlargements from a negative of the Moon by MM. Lœwy and Puiseux, presented by Dr. L. Weinek ; lantern slides from Professor Keeler's drawings of *Mars*, 1892, presented by Mr. Newbegin.

Note on the Indexing of Scientific Papers. By H. Seward, B.A.

In the present condition of scientific periodical literature the question of a subject-matter index is one of very great importance, and the necessity of some such work is yearly becoming more evident. As one who has had a large experience in indexing, especially in indexing of a scientific character, I venture to offer a few remarks on the subject, in accordance with the suggestion of the Secretaries in the last *Monthly Notices.*

First of all it is to be pointed out that a good index can only be made by an expert. It might be supposed that any person of ordinary literary or scientific attainments could make a satisfactory index, but everyone who has studied the subject knows that this view is entirely erroneous. Careful training in classification is absolutely necessary, and this is in most cases the work of years. From this it follows that the system (of indexing by authors), suggested by the Secretaries of the Royal Society, and tentatively adopted by our own Secretaries, can only be regarded as a very temporary one, and that it is one which is certain to break down in practice. The cause of the inevitable failure of this system is not so much the fact that authors often take a view of the importance of their own work which is not shared by their readers, but lies in the impossibility of obtaining uniformity by this method. Thus, to take a simple case : suppose papers on a total eclipse of the Moon are to be indexed, it will be found that these will be variously indexed under the words, "Total," "Eclipse," "Moon," "Lunar," by different authors (without counting such probable entries as "Colour of Eclipsed Moon," "Red Colour of Eclipsed Moon," "Earth's Shadow, Radius of," "Penumbra," &c., &c.), and the unfortunate compilers of an index will have to wade through masses of useless verbiage, meanwhile running the risk of missing something of importance. It can easily be seen that subject matter of a more complicated description, such as, say, "Measurements of the Wave Lengths of the principal lines in the Spectrum of *Nova Aurigæ* as determined by Photography," will lead us at once to hopeless confusion. We are thus drawn to the conclusion, which is, in fact, well known to trained indexers, that the first essential of an index is uniformity ; the same subject matter must always be

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indexed in the same place. What this place is, is comparatively a matter of small importance. For instance, it matters little whether we index "Heliometers" under "Telescopes" or under "Micrometers," provided that all heliometers are indexed under one or the other heading, and not some in one place and some in another.

The next desideratum is to ensure as far as possible that one thing should be indexed in one place, and one place only. The object of this rule is to obtain the maximum of simplicity in the index. Unfortunately it is impossible to carry this out rigidly. It is obvious that such subject matter as "Photographs of Nebulæ" is of interest under both "Photography" and "Nebulæ," and that there will thus be many topics which will require indexing in more than one place. By means of a judicious system of "cross references," much of this repetition can be dispensed with, but there will always be a residuum of certain items which will need double or multiple indexing.

In order still further to obtain uniformity and simplicity, it will generally be found that a small number of indexers is more useful than a larger one. But be the number large or small, when once the general style of the index has been determined, the best practical plan is to draw up what may be called a skeleton index, *i.e.*, a list of headings and sub-headings to be used by the indexers, without any entries after the headings or sub-headings. This skeleton or "Key" index will at first be incomplete, and must be added to as occasion arises, care being always taken not to add anything which will be inconsistent with, or overlap, previously existing items. For this purpose the utmost possible accuracy and definiteness of statement is requisite. The wording of each heading and sub-heading must receive the most careful consideration; all ambiguous terms (such as "&c.") must be discarded; and when once a term has been decided on, no apparently synonymous one must on any account be allowed to take its place in the same heading or in related headings. One thing must always be called by one name, and one only. Besides the headings and sub-headings our "Key" must contain such cross references as are found necessary or desirable, though it is always well to cut down the number of these as far as possible, and also directions as to what subject matter is to be repeated under other headings. No radical or systematic alteration in this "Key" can generally be allowed unless under most exceptional circumstances. Of course with the progress of the science small alterations will frequently become desirable, but even these should be made very sparingly and only under extreme pressure.

The first and most useful practical step will therefore be the preparation of this skeleton index, for when once a working index has thus been obtained, three-fourths of the difficulties of indexing will disappear; it will be found that by far the greater number of items to be indexed will range themselves automatically under one or more headings or sub-headings. A few

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cases only will remain which will require special treatment, usually by the addition of further cross references or new headings or sub-headings to the skeleton index. The utmost care must be bestowed on this "Key," as the facility in dealing with subsequent cases which is thus obtained will more than counterbalance a large amount of trouble in the original preparation. It would appear to be desirable to entrust the compilation of such a "Key" to a small committee, composed of men each with a special knowledge of some particular branch of astronomy, and all with sufficient enthusiasm for the science to take an interest in the little-regarded details of indexing. Such a committee could, with a comparatively small amount of work, achieve results the benefits of which would be felt by our science for many years to come.

We have only considered the question of the indexing of scientific papers in a general way; many of our conclusions may seem quite obvious, and others may seem to be based on unimportant details. The subject of indexing is so little understood, except by those who have had occasion to study it closely, that the importance of the considerations here advanced will probably not at first be admitted, but a very short practical experience will be sufficient to show the immense importance of the two points which we have laid down as essential, viz. *uniformity* and *simplicity*, and in order to carry out these essentials the plan of a skeleton index seems to be the most convenient and feasible one that can be adopted. The actual method of preparation of such an index is, of course, a matter for discussion, as to which many opinions may easily be maintained.

Until such a working index is, at any rate, in course of preparation, it would be well to defer further discussion with special reference to the science of astronomy; but it may perhaps be here noticed that it is very doubtful whether any index on such subjects as measurements of double stars, or observations of variable stars, can conveniently take the place of compiled catalogues such as we find in the published works of Burnham and others.

Note on a Crayon Drawing of the Moon by John Russell, R.A., at the Radcliffe Observatory, Oxford. By E. J. Stone, M.A., F.R.S., Radcliffe Observer.

There is at the Radcliffe Observatory a crayon drawing of the Moon, made by the celebrated artist John Russell, R.A.

The drawing is 4 ft. 11 in. by 5 ft., and bears the date 1795. It is on paper stretched on canvas, and the paper is composed of sections carefully seamed together; the chief seam being across the centre. The surface is not *perfectly* flat.

Mr. Russell died in 1806 May; but the drawing did not